Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal

Section 1. General administrative information

Operation & Maintenance For Upper Yakima River Supplementation Facility

Bonneville project number, if an ongoing project 9701300

Business name of agency, institution or organization requesting funding
Yakama Indian Nation

Business acronym (if appropriate) YIN

Proposal contact person or principal investigator:

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Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
Fish Health USFWS	Olympia Fish Health Center 3704 Griffin Lane SE,Suite 101	Olympia, Wa 98501-2192	Ray Burson
Ros-Elum Cleaning Services	P.O.Box 58	South Cle Elum, Wa 98943	
Cle Elum Fire Dept.		Cle Elum, Wa,98922	
Pudget Sound Energy		Bellevue, Wa 09009-97347	

NPPC Program Measure Number(s) which this project addresses.
7.4K.1

NMFS Biological Opinion Number(s) which this project addresses.

Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a); Biological Assessment of 1997-2001 Hatchery Operations of the Proposed Cle Elum Hatchery, December 1995 (BPA 1995); NMFS concurrence letter dated 4/1/96.

Other planning document references.
Wy Kan Ush Me Wa Kish Wit, Volume II
Appendix B, Columbia Rier Fish Management Plan
Consent Decree from Us vs Oregon CRFMP

Subbasin.
Yakima

Short description.
To implement and test supplementation-based measures in order to increase natural production and harvest opportunities. Supplementation measures will be evaluated using a systematic, experimental program.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish	*	Construction		Watershed
	Resident fish	*	O & M		Biodiversity/genetics
	Wildlife	*	Production		Population dynamics
	Oceans/estuaries	X	Research		Ecosystems
	Climate		Monitoring/eval.		Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.	X	Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.
hatchery-wild interactions

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
8812001	Yakima/Klickitat Fisheries Project Mngmt.	Core Management/Admin. Support services for all YIN'sYKFP Tasks
8811500	Yakima Hatchery Construction	Final design/construction of needed acclimation facilities/wells for YFP
9506300	Yakima/Klickitat M&E Program	Covers the diverse M&E needs for

		the target species which are essential for the success of the YKFP
8812008	Fish Technician Field Activities	Provides exxential technical support to fulfill the diverse needs of the YKFP i.e. M&E support, surveys, juvenile fac. operations, marking, etc
8812005	Fish Passage Video Monitoring	Monitors, at Prosser and Roza dams, the adult salmonids returning to Yakima Basin. The need for this keyM&E information is essential to YKP
9706200	Objectives & Strategies for Yakima	Represents the modeling process,for iterative planning for species consistent with the Regional Assessment of Supplementation Project.
9603301	Yakima River Fall Chinook Suppl-O&M	Essential for YKFP's all stock initiative for experimental purposes for supplementation
9603302	Yakima River Coho Restoration-O&M	Essential for YKFP's all stock initiative for experimental purposes for supplementation
9506404	Policy/Tech Involvement/Planning-YKFP	Supports the required co-manager process for the YKFP
9506406	Monitoring of Supplementation Response Variables for YKFP	Essential for adequate M&E planning and technical participation as co-manager of the YKFP
9506402	Upper Yakima Species Interaction Studies	Vital M&E function relative to behavior of multi species within the Yakima Basin for the YKFP. Defines competitive/ecological interaction
9105700	Yakima Phase 2 Screen Fabrication	Vital to species control within basin for straying into irrigation diversions
9200900	Yakima Screen-Phase II-O&M	Vital to maintain screens for above purpose and effectiveness
9107500	Yakima Phase 2 Screens-Construction	Vital for control within basin for straying into irrigation diversions
9503300	O&M of Yakima Fish Protection, Mitigation & Enhancement Facilities	Vital to maintain screens for control of target species within basin from irrigation diversions.
9704900	Teanaway Instream Flow Restoration	Essential tributary enhancement vital to success of YKFP
9603501	Satus Watershed Restoration	Represents a positive factor for improving tributaries within Yakima

		ABasin; Vital for supplementation
9506800	Klickitat/Habitat Preliminary Design Project YIN	Klickitat, in its preliminary stages, is a vital part of YKFP for the implementation of supplementation.
5512600	Upper Klickitat Meadows Riparian Restoration YIN	Contributes to improving prime habitat which is vital for success of supplementation implementation
5512700	Klickitat Basin Culvert Rehabilitation YIN	Passage within tributaries is essential for natural restoration of species.
5512800	Lower Klickitat Habitat Enhancaement Project, YIN	Essential for improved reproduction of affected species.

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Produce fish to meet production goals for the YKFP	a	a. Furnish rearing, acclimate and release smolts from 1997 brood year adults b. Incubate and rear juveniles from 1998 brook year adults.
2	Continue to develop and test water supply issues at Cle Elum and acclimation sites.	b	a. Monitor quantity and quality of well and stream water supplies to hatchery and acclimation sites. b. Monitor water temperature at all rearing and acclimation sites.
3	Monitor and develop personnel needs at central and acclimation facilities.	c	a. Utilize personnel to operate central and acclimation facilities
4	Utilize and evaluate facilities and equipment to produce fish for experimental needs of YKFP	d	a. Determine if facilities and equipment meet needs to produce quality fish for YKFP> b. Mark fish for identification for experimental evaluation.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	11/1998	12/2048	25.00%

2	11/1998	12/2048	35.00%
3	11/1998	12/2048	7.00%
4	11/1998	12/2048	33.00%
			TOTAL 100.00%

Schedule constraints.
Increase or decrease supply of adults for the facility

Completion date.
N/A

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel		$296,403
Fringe benefits		$47,686
Supplies, materials, non-expendable property		$102,294
Operations & maintenance		$366,572
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	fish marking trailer-150,000 24ft travel trailers-3@11,500 Storage building 40,000	$224,500
PIT tags	# of tags:	
Travel		$8,500
Indirect costs		$233,259
Subcontracts		$84,122
Other	Fish identification 810,000 @ 116/100	$93,960
TOTAL		$1,457,296

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	$1,530,161	$1,606,669	$1,687,002	$1,771,352
O&M as % of total	23.00%	23.00%	23.00%	23.00%

Section 6. Abstract

a. The operation and maintenance of the YKFP's Cle Elum Research and Supplementation Facility (CERSF), including its three acclimation sites (to be constructed in the upper Yakima River Basin).

b. The YKFP's core objectives are as follows:
    1. To test the hypothesis that new supplementation techniques can be used in the Yakima and Klickitat River Basins to increase natural production and to improve harvest opportunities, while maintaining the long-term genetic fitness of the wild and native salmonid populations and keeping adverse ecological interactions within acceptable limits.
    2. To provide knowledge about the use of supplementation, so that it may be used to mitigate effects on anadromous fisheries throughout the Columbia River Basin;
    3. To implement and be consistent with the Council's Fish and Wildlife Program; and
    4. To implement the Project in a prudent and environmentally sound manner.

a. All activities conducted by the YKFP, including the operation and maintenance of the CERSF; are consistent with the NPPC's Columbia River Basin Fish and Wildlife Program ("Program") Measure 7.4K.1.
b. Supplementation is defined as utilizing artificial propagation in an attempt to maintain or increase natural production while maintaining long-term fitness for the target populations and while keeping ecological and genetic impacts on nontarget species within specified limits (RASP 1991).

YKFP operations have been designed to test the principles of supplementation. Its experimental design has focused on the following critical uncertainties affecting hatchery production : 1) the survival of hatchery fish after release from the hatchery; 2) the impacts of hatchery fish as they compete with wild populations; and 3) the effects of hatchery propagation on the long-term genetic fitness of fish stocks.

One of the YKFP's primary objectives is to provide regional resource managers with knowledge regarding these issues, and identify and apply improved methods for carrying out hatchery production and supplementation of natural production. The YKFP's monitoring activities are intended to evaluate the relative survival and success of various release groups of supplementation fish and to compare their success with that of naturally produced fish.

c. The expected outcome of the project is to have supplementation fish return adults in sufficient numbers, and to have a reproductive rate of success that will contribute to the enhancement of the natural populations. The first smolts will be release in 1999, and the majority of the adults will return in 2001 form that release. The project plans to evaluate several generations of releases to obtain a statistically significant result.
d. Project scientists and managers realize that effective monitoring is the key to a successful adaptive management program. The YKFP's PSR and the Monitoring and Evaluation Plan lay out an integrated multi-level monitoring program for supplementing upper Yakima spring chinook. This structure ensures that strategies are implemented as intended, that experimental studies produce reliable results, and that risks associated with unresolved uncertainties re contained. The Project's upper Yakima spring chinook monitoring plan addresses the following five monitoring

categories: 1. Quality Control will monitor the performance of the facilities and their operator. 2. Product specification attributes will be monitored at the Cle Elum facility, the acclimation ponds, and the juvenile monitoring facilities to determine whether the fish produced by the project meet goals with respect to: fish health, morphology (size and shape); behavior; and survival. 3. Research monitoring activities will be designed to test the performance of two treatments of artificially reared fish (OCT vs SNT) and to compare their performance with naturally reared fish. Research monitoring would include measurements of performance in four main areas:

- post release survival (survival from time of release until the fish return to spawn);
- reproductive success (number of offspring produces per spawner);
- long-term fitness (genetic diversity and long-term stock productivity); and
- ecological interactions (population abundance and distribution, growth rates, carrying capacity, survival rates, transfer of disease, and gene flow).

4. Risk containment and 5. Monitoring of stock status. Details can be found in YKFP's M & E project #9506300.

Section 7. Project description

a. Technical and/or scientific background.

First year operations at the YKFP's Upper Yakima Supplementation Complex, Cle Elum, WA, production of 1997's spring chinook broodstock progeny to be incubated at the Complex, then transferred for volitional release at acclimation sites, as per YKFP experimental hatchery guidelines.

Fish production at the Cle Elum Supplementation Complex began in 1997. Construction of this Complex was completed in August 1997.

Broodstock collection for spring chinook began in May 1997. Chinook adults were transported from Roza Dam by truck and held at the Complex until spawning, which began September 3, 1997. The eggs collected from 1997 broodstock will be incubated through the fall and winter until fry ponding in raceways in spring 1998. Fry will be held in raceways under SemiNatural Treatment (SNIT) and the Optimum Conventional Treatment (OCT) throughout the spring, summer and fall of 1998.

The final design and construction of three acclimation sites will occur in 1998. The juveniles at the Complex will be transferred to the acclimation sites in the winter for volitional release in the spring of 1999.

Fish production for the 1998 broodstock will begin with collection at Roza Dam in May and follow procedures outlined for the collection, transport, holding, spawning and incubation described for the 1997 broodstock. The preseason forecast for the 1998 spring chinook run will be utilized to determine the number of adults that will be taken in that year.

At full production of 810,000 smolts from the project, a total of 1,245,000 eggs would be needed. Based on data collected from the 1997 broodstock, this would require about 313 female and 251 male adult salmon broodstock. The total adult broodstock collection would be 564 fish. The 1998 spring chinook run is expected to be very low. The project, based on Genetic Hatchery Guidelines (GHG) proposes to take no more than 50% of the returning adults into the Complex. Thus a final determination of broodstock collection will be made as more information of the expected 1998 run size is developed.

Fish production. The production from the 1997 broodstock was estimated at 534,168 eggs from a total of 133 spawned females. The potential smolt release at acclimation sites for spring 1999 is estimated at 430,000 smolts.

Planned production from the 1998 broodstock will be determined when the estimates for the total run size have been calculated. Full production would be 810,000 smolts from 1,245,000 eggs.

Water supply. The Washington Department of Ecology and CH2MHill are currently consulting with the YIN and BPA in developing and resolving river and well water supply issues that remain at the Cle Elum Supplementation Complex, as well as at the three proposed acclimation sites at Easton, Teanaway and Thorp.

Personnel. The Upper Yakima Supplementation staff will consist of one Complex Manager, two Assistant Complex Managers, two Fish Culturist IV's, one Office Assistant, and one Night Watchman.

Equipment. The Complex has been equipped for operation in 1997 to include broodstock collection, holding, spawning and incubation. Additional equipment will be needed in 1998 for juvenile rearing under SemiNatural Treatment (SNIT) and Optimum Conventional Treatment (OCT) at the Cle Elum Complex. Facilities and equipment will need to be aquired for the acclimation and release of the 1997 brood year smolts in the winter of 1998/1999.

Safety. Safety issues at the Cle Elum Complex and at each of the acclimation sites should be identified through the certification process.

Production Plan. The EIS for the Upper Yakima Spring Chinook Supplementation Complex authorizes the construction of a facility to produce 810,000 spring chinook smolts for the release in the Yakima River. This goal is based on available water and run size of native spring chinook. The first year of production is set to produce 430,000 smolts. The Scientific and Technical Advisory Committee (STAC) is working with the Monitoring Implementation Planning Team to determine the most appropriate and beneficial distribution of those fish (one or two full treatment groups) for the experimental goals of the project.

The production plan for the 1998 broodstock year is full production of 810,000 smolts. This production plan is subject to further analysis and revision as data on 1998 run size is developed.

Satellite Facilities. Three satellite facilities are planned for release of the spring chinook smolts for the Upper Yakima Complex. These facilities are scheduled for final design and construction in 1998. The first smolts, progeny of the 1997 broodstock, will be released in 1999. Current expectations are that two full treatments will be used, necessitating two acclimation facilities. Engineers have strongly advised construction of all three facilities for certification and testing purposes in 1999.

b. Proposal objectives.

The Project managers have agreed on a set of objectives and strategies for supplementing each of the Yakima River Basin stocks. Since the Project's inception, these objectives and strategies have been reviewed (i.e. critical peer review) and revised. The objectives and strategies are precise and increasingly specific statements about the YKFP in four categories: genetics, natural production, experimentation, and harvest, while taking steps to contain unacceptable genetic and ecological risks.

Quantitative production objectives (for most of the seven stocks originally identified to be supplemented as part of the YKFP) were formulated in 1990 in the Refined Goals section of the Preliminary Design Report (BPA, 1990b). The Refined Goals objectives were based on computer simulations generated by the Council's System Planning Model.

Project objectives are continually re-assessed in the light of the latest demographic data, suspected ecological relationships, and modeling tools. Quantitative production objectives for upper Yakima spring chinook have been refined, based on computer simulations using the Ecosystem Diagnostic and Treatment Planning Model (EDTPM) (Lestelle et al., 1994) developed under the Regional Assessment of Supplementation Project (RASP, 1992). BPA and the project managers have used the EDTPM for YKFP planning rather than the System Planning Model, because it tracks juvenile production capacity more closely and allows for variable (density-dependent) predation on outmigrating smolts.

Taken from the YKFP's Planning Status Report 1995, Volume 3, the Table below presents the latest version of the objectives and strategies for spring chinook.

Upper Yakima Spring Chinook Objectives and Associated Strategies

Objectives	Strategies
Genetic	
Manage genetic risks (extinction, loss of within- and between-population variability, and domestication selection) to all stocks from management of the fishery.	Segregate identified stocks by selecting broodstock for which the origin can be reasonably well determined, and release hatchery-reared progeny only in ancestral drainages. Use for broodstock only those fish that are not first-generation hatchery fish. Operate the supplementation facilities using appropriate mating procedures, naturalized environments, and experimental numbers to reduce the possibility of extinction, loss of within- and between-population variability, and domestication selection. Use less than 50% of the natural-origin returning adult escapement from each stock for broodstock purposes. Manage the proportion of natural- to hatchery-origin adults allowed to spawn naturally.
Conserve upper Yakima and Naches stocks of spring chinook salmon.	Segregate identified stocks by selecting broodstock for which the origin can be reasonably well determined, and release hatchery-reared progeny only in ancestral drainages. Collect, identify and segregate spring chinook by stock, through spawning, rearing and release.
Conserve the American River stock of spring chinook salmon.	Collect, identify and segregate spring chinook by stock, through spawning, rearing and release. Develop and apply methods to maximize the likelihood that only American River-origin fish enter and spawn in the American River.
Natural Production	
Optimize natural production of spring chinook with respect to abundance and distribution.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima basin.
Optimize natural production of spring chinook salmon while managing adverse impacts from interactions between and within species and stocks.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima basin.

Natural Production (con't)	
Maintain upper Yakima spring chinook natural production at a level that would contribute an annual average of 3,000 fish to the Yakima Basin adult return.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima Basin.
Maintain natural escapement of upper Yakima spring chinook (hatchery and wild) at an average of 2,000 adult returns and consistently greater than 1,700 spawners per year.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima Basin.
Experimentation	
Learn to use supplementation as defined by the RASP (RASP, 1992) to increase natural production of upper Yakima spring chinook and increase harvest opportunities.	Conduct experiments using upper Yakima stocks to evaluate the risks and benefits of supplementation as defined by the RASP (1992). Design and conduct experiments using upper Yakima stocks to compare risks and benefits of a Semi-Natural Innovative Treatment (SNT) against an Optimal Conventional Treatment (OCT) for supplementation. The SNT would use methods resulting in fish that mimic natural fish. The OCT would use methods resulting in fish raised according to the state-of-the-art hatchery definition of quality. Collect upper Yakima broodstock at Roza Dam. Release 18 groups of 45,000 fish each of the upper Yakima stock into the upper Yakima River. Release experimental groups of fish from separate acclimation sites connected to target streams. Design experiments to detect a 50% or greater difference (with 90% certainty) between test treatments for all response variables.
Harvest	
Increase harvest opportunities for all fishers consistent with requirements of genetic, natural production, and experimentation objectives.	Use selective and/or "status-index harvest" policies to increase harvest opportunities for all fishers.

The YKFP will incorporate two repeated tests or treatments: a Semi-Natural Innovative Treatment using incubation, rearing, and release techniques that attempt to produce smolts with attributes and, consequently, survival, similar to those of wild or native fish, and an Optional Conventional Treatment. The Optimal Conventional Treatment ("OCT") will incubate, rear, and acclimate salmonids using the currently accepted "Best Technology" used at state, Tribal, and Federal hatcheries. The Semi-Natural Innovative Treatment ("SNT") will create a more natural environment (e.g., natural cover, substrate, and structures) to incubate, rear, and acclimate fish. This treatment is calculated to raise and release fish with characteristics and behavior similar to those of naturally produced fish in order to achieve improved survival and productivity.

The fish from these two treatments will be compared (e.g., in terms of physical characteristics and survival to returning adults) with each other as well as to the native fish. These comparisons would be used to determine the success of the YKFP. As much as possible, information on variation in ocean conditions, instream flows, harvest, and other activities and factors would be used to provide a context for interpretation of YKFP findings.

There are three stocks of spring chinook in the Yakima River: an upper Yakima stock that spawns upstream of Roza Dam, a stock that spawns in the Naches River, and one in the American River. Of these, only the upper Yakima spring chinook stock will be supplemented during the Project's first phase. This program includes facilities to release up to 810,000 such smolts each year.

Natural production objectives for all Yakima River spring chinook stocks were modeled assuming that all upper Yakima supplementation facilities were operational and were producing a range of 600,000 to 1,150,000 smolts. As modeled, the proposed production level (810,000 smolts) would be expected to produce adult returns, spawning, and harvest objectives in the middle of the range of estimates that follow. Simulations indicated that production levels would produce a total return to the Yakima basin that would range from 8,200 to 11,590 adults: 6,600 to 9,800 upper Yakima spring chinook, 1,000 to 1,100 Naches spring chinook, and 600 to 690 American River spring chinook. Objectives for natural spawning would include 3,100 spring chinook in the upper Yakima (combined wild and hatchery fish at all production rates); 570 to 630 spring chinook in the Naches (all wild); and 340 to 390 spring chinook in the American River (also all wild). Spawning escapement (how many adult fish return to spawn) for all stocks would be above the level (approximately 200-250 spawners per year) at which loss of within-population variability becomes a concern.

The quantitative production objectives described above for upper Yakima spring chinook are based on the EDTPM computer simulations. These natural production and harvest objectives make the following assumptions:

1) that hatchery fish survive at half the rate of wild fish in an environment in which natural production is winter-limited;

2) that carrying capacity is about 543,000 smolts naturally produced in the upper Yakima River under current habitat conditions and operation of the river for irrigation (900,000 smolts for the entire Basin); and

3) that up to 240,000 smolts (27 percent of carrying capacity) can be lost to density-dependent mortality inside the subbasin (Watson et al., 1993).

Under these conditions, the EDTPM indicates that natural production and harvest objectives are attainable with a terminal harvest rate of 30 percent, applied uniformly over all stocks. The EDTPM assumptions included selective removal of between 100 and 3,000 upper Yakima hatchery fish in order to limit the maximum proportion of hatchery fish in the natural spawning escapement to 50 percent or less.

Note that these preliminary supplementation strategies and production objectives are based on modeled assumptions, not on empirical data. The assumptions underlying the computer analyses represent a reasonable synthesis of what is known at present about the natural production and post-release survival of spring chinook in the Yakima River

(Watson et al., 1993). Future and ongoing risk analysis and ecological research would be expected, through the normal operation of the annual planning and implementation cycle, to result in refinements to supplementation strategies and perhaps to objectives as well.

c. Rationale and significance to Regional Programs.

The Yakima Klickitat Fisheries Project is part of a comprehensive effort by the Northwest Power Planning Council, Yakama Indian Nation, Washington Department of Fish and Wildlife, U.S. Bureau of Reclamation, U.S. Forest Service, and the Bonneville Power Administration to protect, mitigate and enhance the anadromous fish populations in the Yakima and Klickitat River basins. These governments and agencies have developed and implemented a long-term strategy to restore the habitat and ecosystem necessary to support the anadromous fish resources in the Yakima River basin and to increase fish production through supplementation.

Planned by the Council since 1982 and included its Columbia River Basin Fish and Wildlife Program ("Program") as Measure 7.4K.1, the YKFP's operation is calculated to compensate for losses from development and operation of hydroelectric projects elsewhere in the Columbia Basin. Project development has been subject to the NMFS Biological Opinion for 1995 to 1998 Hatchery Operations in the Columbia River Basin (NMFS 1995a) and BPA's Biological Assessment of 1997-2001 Hatchery Operations of the Proposed Cle Elum Hatchery, December 1995 (BPA 1995), which was concurred to by NMFS in its letter dated 4/1/96. See YKFP Final EIS, January 1996.

d. Project history

The Yakima Klickitat Fisheries Project ("YKFP or Project") was first approved by the Northwest Power Planning Council ("NPPC or Council") in 1982. At that time, the Council envisioned the Project as a cluster of production facilities in both the Yakima and Klickitat River Basins designed to enhance the fishery for the Yakama Indian Nation ("YIN") and other harvesters. The development of the Project's master plan began in 1985. By that time, however, the Council had modified the purpose of the Project to include research activities testing the assumption that new supplementation methods could increase natural production while protecting the genetic resources common to the river basins. The Council also determined that the principles of adaptive management, which encourages an affirmative pro-active response to research discoveries, were to be utilized by the resource managers selected to manage the YKFP. These managers are the YIN and the Washington Department of Fish and Wildlife ("WDFW").

As recommended and directed by the Council, the Project's master plan, which included a supplementation research program, was conceived and developed. On October 15, 1987, the Council approved the YKFP's master plan, which included the construction of the production and acclimation facilities in the Upper Yakima River Basin commonly

referred to as the Upper Yakima Supplementation Complex ("UYSC or Complex"). Consistent with the NPPC's Columbia River Basin Fish and Wildlife Program ("Program") Measure 7.4K.1, the Project's Preliminary Design Report was completed in 1990. At that time, an Environmental Assessment (EA) was prepared for YKFP construction activities and facility operations throughout the Yakima and Klickitat River Basins.

In 1992, the Project began the process of preparing an Environmental Impact Statement ("EIS"). During the EIS's preparation period, the Council endorsed the managers proposal to "tier" the Project's production and research activities by bringing them on-line in gradual stages. The first phase (tier) targeted the supplementation of depressed populations of upper Yakima river spring chinook. This initial phase also included research designed to determine the feasibility of re-establishing a naturally spawning population and a significant fall fishery of coho salmon in the Yakima Basin. Future phases of the YKFP include the supplementation of fall chinook and steelhead, and a reintroduction of now extirpated stocks. Also envisioned for the Project's future is the introduction of supplementation to the Klickitat Basin, which could include the use of the Klickitat Hatchery, a Mitchell Act facility now operated by WDFW.

By design, the supplementation of summer steelhead and fall chinook populations in the Yakima basin was not detailed in the initial EIS. Research activities focused upon the Klickitat River fisheries also fell outside its scope. However, they remain essential components of the Project. At this time, fall chinook, steelhead and the Klickitat basin are the subjects of on-going research activities designed to determine whether the YKFP will support the introduction of additional anadromous fish stocks into its production and research programs.

The Project's EIS was completed in 1996, and the Record of Decision ("ROD") was signed by BPA's Administrator and Chief Executive Officer, Randall W. Hardy, on March 13, 1996. With the completion of the EIS and the signing of the ROD, construction of the YKFP's Cle Elum Supplementation and Research Facility ("Cle Elum Facility") began in May of 1996. The Cle Elum Facility was completed on August 1, 1997. The UYSC also includes three acclimation facilities to be constructed in the Upper Yakima basin. Thus far, the YIN, as the Project's Lead Agency and the UYSC's operator, has captured 240 adult spring chinook at the Roza adult collection facility. Egg taking and fertilization procedures were performed in September 1997. 450,000 eggs were fertilized and incubated at the facility. Funding for the continued operation and maintenance of the UYSC has been approved by the Council and included in Program Measure 7.4K.1.

Earlier YKFP project numbers included under the Council's Fish and Wildlife plan are as follows:

82-016 - YAKIMA RV. SPRING CHINOOK ENHANCEMENT STUDY - YIN
85-062 - PASSANGE IMPROVEMENT EVALUATION - BPNL
86-045 -YAKIMA HATCHERY PRE-DESIGN - CLE ELUM PROJECT - NMFS

86-101 -FILMING FOR PROJECT RECORD - MOVING PICTURES INC.
87-135 -YAKIMA HATCHERY - MASTER PLAN DEVEL - YIN
87-136 -YAKIMA HATCHERY - WAPATO CANAL PEN REARING - YIN
87-414 -YAKIMA ANADROMOUS FISH A/V - JOHN CAMPBELL
88-120 -YAKIMA NAT. PROD. & ENHANCEMENT PROG. - YIN
88-120-01 -YAKIMA/KLICKITAT FISHERIES PROJECT MGMT. - YIN
88-120-02 -YAKIMA ENGINEER ASSISTANCE - YIN
88-120-03 -YAKIMA SPECIES INTERACTION - YIN
88-120-04 -HATCHERY TRAINING AND EDUCATION - YIN
88-120-05 -FISH PASSAGE VIDEO MONITORING - YIN
88-120-06 -YAKIMA FISHERIES TECHNICIANS - YIN
88-120-07 -YAKIMA SPRING CHINOOK NATURAL PROD. - YIN
88-120-08 -FISHERIES TECHNICIAN FIELD ACTIVITIES - YIN
88-120-09 -STEELHEAD AND FALL CHINOOK PROD. OBJECTIVES - YIN
88-123 -YAKIMA HATCHERY COORDINATION - ROZA IRRIGATION DISTRICT
88-149 -YAKIMA HATCHERY - WATER ANALYSIS - BOR
88-167 -YAKIMA HATCHERY ECONOMIC STUDY - CWU
89-082 -YAKIMA HATCHERY - EXPERIMENTAL DESIGN - WDFW
89-083 -YAKIMA HATCHERY - EXPERIMENTAL DESIGN - WDFW
89-089 -YAKIMA/KLICKITAT RADIO TELEMENTRY STUDY - NMFS
89-100 -YAKIMA HATCHERY ENVIRONMENTAL ASSESS. REVIEW - BPNL
89-105 -YAKIMA - SPECIES INTERACTION STUDY - WDFW
90-058 -YAKIMA HATCHERY – PROJ. LEADER FUNCTION - SAMPSEL CONS.
90-062 -CLERICAL SERVICES-YAKIMA PROJECT - PENNYS FROM HEAVEN
90-065 -CHANDLER JUVENILE TRAP CALIBRATION - NMFS
90-069 -YAKIMA HATCHERY - FINAL DESIGN - CH2M HILL
90-045 -YAKIMA ADULT/JUVENILE TRAPPING FINAL DESIGN - BOR
91-048 -EVAL. OF ENV. IMPACTS OF YAKIMA PROD. PROG. - BPNL
91-055 -SUPPLEMENTATION FISH QUALITY (YAKIMA) - NMFS
91-059 -FOOD ABUNDANCE YAKIMA RV TROUT, STLHD, CHINOOK - CWU
92-021 -EXPERIMENTAL DESIGN DEVELOPMENT - CWU
94-037 -YAKIMA BIO SPEC INTERFACE - HATCHERY OP CONSULTING
94-036 -ECONOMIC IMPACT ANALYSIS YAKIMA RV BASIN - CWU
94-040 -QUANTITATIVE PROD. OBJ. FOR YAKIMA FALL CH. & STLHD - MOBRAND
95-055 -UPDATE OF YAKIMA FISH PROJECT ECONOMIC ANALYSIS - CWU
95-062 -YAKIMA/KLICKITAT FISH. PROJECT ADAPT. MGMT. -
95-063 -YAKIMA/KLICKITAT MONT. AND EVAL. PROGRAM -
95-064 -YAKIMA FISHERIES PROJECT SCI. MGMT SERVICES - WDFW
95-064-01 -REFINEMENT OF MARKING METHODS FOR YKFP - WDFW
95-064-02 -UPPER YAKIMA RIVER SPECIES INTERACTION STUDIES - WDFW
95-064-03 -GENETIC MGMT. FRAMEWORK FOR YAKIMA SP. CHINOOK - WDFW
95-064-04 -POLICY/TECHNICAL INVOLVEMENT AND PLANNING - WDFW
95-064-05 -FURTHER DEVEL. OF NIT/LNIT REARING STRATEGY FOR YKFP - WDFW
95-068 -KLICKITAT PASSAGE/HABITAT PRELIMINARY DESIGN - YIN

BONNEVILLE PROJECT SPECIFIC SUPPORT

88-034 -ENGINEERING SUPPORT --YAKIMA HATCHERY (also 92-029, 91-080) - BPA
88-115 -YAKIMA HATCHERY CONSTRUCTION - BPA
89-042 -ENGINEERING SERVICES PREL. DESIGN S&S FACIL -
89-043 -YAKIMA HATCHERY - PRELIMINARY ENGINEERING -
89-093 -BPA CONSTRUCTION SUPPORT FOR YAKIMA HATCHERY - BPA
93-081 -BPA LANDS SUPPORT FOR YAKIMA HATCHERY - BPA

95-037 -SUPPORT FROM FACILITIES DESIGN - BPA
95-038 -SUPPORT FROM CONSTRUCTION SERVICES - BPA
95-040 -SUPPORT FROM REAL ESTATE - BPA
95-061 -SUPPORT FOR ENVIRONMENTAL ANALYSIS -
95-069 -YAKIMA/CLE ELUM LAND PURCHASE -

A summary of Project reports and technical papers can be found in the YKFP's Final EIS (January 1996). All major research results are include in those reports. Hardcopies of these reports are in the possession of BPA's Fish and Wildlife Program.

Because the YKFP is attempting to mitigate for effects on declining natural resources in a complicated, large-scale ecosystem without a full understanding of its complexities, the Project managers believe the principles of adaptive management to be particularly appropriate tools. By incorporating them into the Project's scientific method, the managers expect to achieve Project goals while protecting the basin's fishery resources from unforeseen, adverse Project impacts.

In applying adaptive management, actions by YKFP managers will respond to a set of agreed-upon objectives. These actions are designed as experiments to test hypotheses regarding their outcome: to see whether the predicted result occurs or whether some other result occurs. Carefully designed to obtain valid (i.e., statistically reliable) results, the experiments are conducted, monitored and evaluated to allow statistical evaluation of the results. New experimental insights are used to modify or discard ineffective strategies, to improve underlying theory and, when necessary, to revise objectives to conform with perceived possibilities. Informed Project scientists and managers may modify programs, procedures, and facilities in response to these findings, even if it means drastic changes to a program. Thus risks to the ecosystem are realized and addressed in the Project's annual planning cycle (described in detail below), which will annually examine the capacity and constraints of the stock and stream system, as well as the performance of hatchery fish, testing and revising a theory of supplementation. The rearing and release of each new group of smolts will represent an experimental test of the latest revision of the theory.

e. Methods.

Taken from the YKFP's Planning Status Report 1995, Volume 3, the Table below presents the latest version of the objectives and strategies for spring chinook.

Upper Yakima Spring Chinook Objectives and Associated Strategies

Objectives	Strategies
Genetic	
Manage genetic risks (extinction, loss of within- and between-population variability, and domestication selection) to all	Segregate identified stocks by selecting broodstock for which the origin can be reasonably well determined, and release hatchery-reared progeny only in ancestral drainages.

stocks from management of the fishery.	Use for broodstock only those fish that are not first-generation hatchery fish. Operate the supplementation facilities using appropriate mating procedures, naturalized environments, and experimental numbers to reduce the possibility of extinction, loss of within- and between-population variability, and domestication selection. Use less than 50% of the natural-origin returning adult escapement from each stock for broodstock purposes. Manage the proportion of natural- to hatchery-origin adults allowed to spawn naturally.
Conserve upper Yakima and Naches stocks of spring chinook salmon.	Segregate identified stocks by selecting broodstock for which the origin can be reasonably well determined, and release hatchery-reared progeny only in ancestral drainages. Collect, identify and segregate spring chinook by stock, through spawning, rearing and release.
Conserve the American River stock of spring chinook salmon.	Collect, identify and segregate spring chinook by stock, through spawning, rearing and release. Develop and apply methods to maximize the likelihood that only American River-origin fish enter and spawn in the American River.
Natural Production	
Optimize natural production of spring chinook with respect to abundance and distribution.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima basin.
Optimize natural production of spring chinook salmon while managing adverse impacts from interactions between and within species and stocks.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima basin.

Natural Production (con't)	
Maintain upper Yakima spring chinook natural production at a level that would contribute an annual average of 3,000 fish to the Yakima Basin adult return.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima Basin.
Maintain natural escapement of upper Yakima spring chinook (hatchery and wild) at an average of 2,000 adult returns and consistently greater than 1,700 spawners per year.	Improve the physical, biological, and chemical environment on a priority basis. Use harvest controls and supplementation to optimize natural spawning distribution (temporal and spatial). Release 810,000 acclimated smolts into the upper Yakima Basin.
Experimentation	
Learn to use supplementation as defined by the RASP (RASP, 1992) to increase natural production of upper Yakima spring chinook and increase harvest opportunities.	Conduct experiments using upper Yakima stocks to evaluate the risks and benefits of supplementation as defined by the RASP (1992). Design and conduct experiments using upper Yakima stocks to compare risks and benefits of a Semi-Natural Innovative Treatment (SNT) against an Optimal Conventional Treatment (OCT) for supplementation. The SNT would use methods resulting in fish that mimic natural fish. The OCT would use methods resulting in fish raised according to the state-of-the-art hatchery definition of quality. Collect upper Yakima broodstock at Roza Dam. Release 18 groups of 45,000 fish each of the upper Yakima stock into the upper Yakima River. Release experimental groups of fish from separate acclimation sites connected to target streams. Design experiments to detect a 50% or greater difference (with 90% certainty) between test treatments for all response variables.
Harvest	
Increase harvest opportunities for all fishers consistent with requirements of genetic, natural production, and experimentation objectives.	Use selective and/or "status-index harvest" policies to increase harvest opportunities for all fishers.

The YKFP will incorporate two repeated tests or treatments: a Semi-Natural Innovative Treatment using incubation, rearing, and release techniques that attempt to produce smolts with attributes and, consequently, survival, similar to those of wild or native fish, and an Optional Conventional Treatment. The Optimal Conventional Treatment ("OCT") will incubate, rear, and acclimate salmonids using the currently accepted "Best Technology" used at state, Tribal, and Federal hatcheries. The Semi-Natural Innovative Treatment ("SNT") will create a more natural environment (e.g., natural cover, substrate, and structures) to incubate, rear, and acclimate fish. This treatment is calculated to raise and release fish with characteristics and behavior similar to those of naturally produced fish in order to achieve improved survival and productivity.

The fish from these two treatments will be compared (e.g., in terms of physical characteristics and survival to returning adults) with each other as well as to the native fish. These comparisons would be used to determine the success of the YKFP. As much as possible, information on variation in ocean conditions, instream flows, harvest, and other activities and factors would be used to provide a context for interpretation of YKFP findings.

There are three stocks of spring chinook in the Yakima River: an upper Yakima stock that spawns upstream of Roza Dam, a stock that spawns in the Naches River, and one in the American River. Of these, only the upper Yakima spring chinook stock will be supplemented during the Project's first phase. This program includes facilities to release up to 810,000 such smolts each year.

All assumptions critical to the YKFP's design and operation are detailed in the Project's Spring Chinook Planning Status Report.

The sample size of the experimental treatment and control groups was set at 45,000 smolts per release group. This sample size was determined by use of power analysis modeling, and details can be found in "Experimental Designs for Testing Differences in Survival Among Salmonid Populations", 1995, Hoffman et al.

Project scientists and managers realize that effective monitoring is the key to a successful adaptive management program. It enables them project managers to determine whether an action achieved its objective, or whether the objective was properly developed. Monitoring should also provide insight into the actual result of an action as well as explain the success (or lack) in achieving the predicted result.

The YKFP's PSR lays out an integrated multi-level monitoring program for supplementing upper Yakima spring chinook. This structure ensures that strategies are implemented as intended, that experimental studies produce reliable results, and that risks associated with unresolved uncertainties are contained. It also ensures efficiency, prevents duplication of effort, and tracks progress toward meeting objectives.

Since monitoring activities for these categories overlap, they will be developed into an integrated monitoring plan. The monitoring plan would be revised and expanded as part of the adaptive management process. The Project's upper Yakima spring chinook monitoring plan, which will be used as a template for future production activities, addresses the following five monitoring categories:

1. Quality control will monitor the performance of the facilities and their operators. Standards would be developed for all fish culture and data collection activities as part of the certification process required for the facilities. Monitoring procedures would be included in the operations manuals for all facilities and field activities.

2. Product specification attributes will be monitored at the Cle Elum facility, the acclimation ponds, and the juvenile monitoring facilities to determine whether the fish produced by the project meet goals with respect to: fish health; morphology (size and shape); behavior; and survival.

3. Research monitoring activities will be designed to test the performance of two treatments of artificially reared fish (OCT vs. SNT) and to compare their performance with naturally reared fish. These monitoring activities would be performed at the Roza

and Chandler juvenile facilities for outmigrating smolts, at the Prosser and Roza fish ladders and collection facilities for returning adults, and on the spawning grounds for straying rates and reproductive success monitoring. Research monitoring would include measurements of performance in four main areas:

o post-release survival (survival from time of release until the fish return to spawn);
o reproductive success (number of offspring produced per spawner);
o long-term fitness (genetic diversity and long-term stock productivity); and
o ecological interactions (population abundance and distribution, growth rates, carrying capacity, survival rates, transfer of disease, and gene flow).

4. Risk containment consists of a monitoring plan developed to evaluate four categories of interest identified in the risk analysis to monitor risk containment: 1) experimental; 2) genetic; 3) harvest; and, 4) natural production/ecological interactions. These four areas relate back to the objectives and strategies. The risk analysis defines risk in terms of the probability of failure to meet the objectives of the project for these four categories.

5. Monitoring of stock status includes measurements of run size and escapement to determine whether harvest objectives can be met without affecting natural production. It would provide information essential to track the long-term performance and fitness of the fish populations.

Details of the monitoring program can be found in "Yakima Fisheries Project Spring Chinook Supplementation Monitoring Plan", Busack et al, 1997. Also see YIN project 9506300, YKFP Monitoring and Evaluation Proposal.

Implementation of the monitoring plan, annual review of the findings, and subsequent adjustment, as necessary, of the supplementation program objectives, strategies, assumptions, uncertainties, and risk analysis would complete the feedback loop that is essential to the success of the adaptive management process, and ultimately, the entire project.

f. Facilities and equipment.

The Upper Yakima River Supplementation Complex utilizes all buildings and their components at the central facility for ongoing spring chinook salmon enhancement projects. Each facility building or structure dedicated to hatchery operations and research, is described below.

Office Building. All pertinent record-keeping and daily personnel activities on and off site of the Complex are monitored by the Manager here. Project purchases, service contracts and employee timekeeping are routed through this building. Policy, monitoring and biological meetings and workgroups affecting YKFP activities are routinely held in the conference room.

Capitol expenses for the office building include furniture, i.e. computer desks, chairs, tables and filing cabinets.

Hatchery Building. Egg incubation is the essential priority of this building. Fertilized eggs are contained and incubated in isolation buckets in the hatch-house large troughs, and prior to hatching transferred to and incubated in heath stack trays. Egg fertilization according to GHG takes place in the water-hardening room, as well as ovarian fluid and egg sampling. The laboratory is utilized to process adult and juvenile mortalities, assess post-spawning success, provide fish health specialists medium and space to work with.

Capitol expenses include purchasing incubation troughs, a fry tank for moving fry from the hatchery to outside raceways, a Jensorter for egg enumeration and removing unfertilized eggs and storage cabinets.

Freezer/Food Building. The large freezer room is where perishable fish food, adult mortalities and micellaneous perishable items are stored, as well as fish food for the acclimation sites. A battery-powered golfcart for transporting food, materials and tools to and from buildings and ponds,is also stored in this building.

Capitol expenses include a 10' x 15' refridgeration unit (cooler), tables and storage cabinets.

Maintenance Building. The maintenance building provides a working area, including equipment and storage, for staff in regards to carpentry, plumbing, mechanical and electrical needs for the Complex and acclimation sites. Large and small equipment, including pumps, pressure washers and a fish pump, are kept out of the weather here. The chiller system that supplies chilled well water to the hatch-house, the cryogenic freezer for genetic material, and the domestic water tank, are also located in the maintenance building. A Hyster 50 electric forklift, used for loading, unloading and other projects, is stored here along with the adult transport tank truck, a John Deere 540 tractor with snowblower attachment for clearing snow on Complex grounds and Charter road, a Toro lawnmower with snowblower attachment, and a snowblade for a one-ton flatbed truck.

Capitol expenses include the puchase of a magnetic drill, used at the Complex and to be used at the acclimation sites to secure bird-predation steel "T" support frames together, a millermatic 250 wirefeed welder, a state-of-the-art fish pump for transferring fish from the pond to the tank truck, and the snow blade for the one-ton truck

Electrical generator Building. Provides emergency electricity to the Complex and housing in the event of a electrical power outage.

No capitol expenses to date.

Generator building. Provides emergency electricity to the hatchery wells in the event of an electrical power outage.

No capitol expenses to date.

Ponds. There are twenty outside ponds that will be used as rearing vessels for salmon juveniles. As per experimental rearing guidelines outlined in the YKFP, treatment and control populations will be held here, and in similarily designed ponds at the three acclimation sites. The pond site has a steel "T" framework at the head and tailrace sections of the ponds, which support bird predation cables and netting. All ponds have a vacuum system for removing fish waste from the pond floor. An underwater feeding system will be implemented in the ponds at the Complex and acclimation sites, as per experimental design in the feeding protocols.

Water flow (gpm) is measured by an ultrasonic level element and transmitter in the tailrace of each pond, where flow rate information is downloaded and recorded to the main computer in the office building. Aluminum baffles that surround the ultrasonic element, designed by CH2MHill and fabricated by the BPA, will be installed to reduce erroneous readings from the element due to water turbulence at the tailrace outfalls. This work will be performed by the BPA.

The YKFP plans include a fish marking trailer and six coded-wire tagging machines, four standard and two backup, for marking fish at the Complex and acclimation sites. Electrical outlets for the trailer have been installed on Complex ponds, and are included in the acclimation pond designs.

Pond floor media panels are included in the experimental design, crafted to mimic the color and cobble of riverine habitat. Fabrication and installation of these panels will be contracted to an outside party.

Capitol expenses include the equipment for the underwater feeders, hoses and vacuum apparatus for cleaning ponds at the Complex and acclimation sites, the ultrasonic element baffles, an electronic fish counter, the fish marking trailer and coded-wire tagging machines, media floor panels, and bird predation netting and cable.

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Hatchery headbox. River and well water is supplied to the Complex hatchery building and ponds, with well water delivery to the chiller system, through the hatchery headbox. Raw process well water is oxygenated and supersaturated nitrogen gas removed through two degassing towers: a hatchery supply and a truck-fill supply tower. A pump that delivers no less than 300 gpm is necessary as backup for the process well water pumps (3each, 900 gpm total) that pump water into the degassing tower, through to the hatchery building and chiller room. To lose the headbox pumps to mechanical failure, will result in catastrophic fry loss in the hatchery, as pumping water into the hatchery was the single design option.

Capitol expenses to include one 300 gpm pump.

Adult headbox. The adult headbox supplies process water to the adult holding ponds. Flow rate and water characteristic are measured at the headbox. Degassification towers are included to increase dissolved oxygen and/or remove supersaturated nitrogen gas from raw well water and reuse water from the raceway.

No capitol expenses to date.

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YIN (Confederated Tribes and Bands of the Yakama Indian Nation). 1990. *Yakima River Subbasin Salmon and Steelhead Production Plan.* Prepared by the Confederated Tribes and Bands of the Yakama Indian Nation, Toppenish, Washington; and Washington Department of Fisheries and Department of Wildlife, Olympia, Washington; for the Northwest Power Planning Council and Agencies and Indian Tribes of the Columbia Basin Fish and Wildlife Authority.

Section 8. Relationships to other projects

The following projects are complimentary with the YKFP:

9105700	Yakima Species 2 Screen Fabrication	Vital to species control within basin for straying into irrigation diversions.
9200900	Yakima Screen Phase II O&M	Vital to maintain screens for above purpose and effectiveness.
9107500	Yakima Phase 2 Screens-Construction	Vital for control within basin for straying into irrigation diversions.
9503300	O&M of Yakima Fish Protection,	Vital to maintain, screesn for control of target species within basin from irrigation diversions.

9704900	Teanaway Instream Flow Restoration	Essential tributary enhancement vital to success of YKFP.
9603501	Satus Watershed Restoration	Represents a positive factor for improving tributaries within Yakima Basin; vital for supplementation
9506800	Klickitat/Habitat Preliminary Design Project YIN	Klickitat, in its preliminary stages, is a vital part of YKFP for the implementation of supplementation
5512600	Upper Klickitat Meadows Riparian Restoration YIN	Contibutes to improving prime habitat which is vital for success of supplementation implementation.
5512700	Klickitat Basin Culvert Rehabilitation YIN	Passage within tributaries is essential for natural restoration of species.
5512800	Lower Klickitat Habitat Enhancement	Essential for improved reproduction of affected species.

Section 9. Key personnel

MELVIN R. SAMPSON
370 N. BROWN ROAD
WAPATO, WASHINGTON 98951
509-848-2854

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EXPERIENCE:

2/93-PRESENT **POLICY ADVISOR/PROJECT COORDINATOR**
Yakima/Klickitat Fisheries Project
Yakama Indian Nation
Toppenish, WA 98948

1989-1992 **PRESIDENT**
-Melco Petroleum Inc., Wapato, WA 98951
***Wholesale fuel distribution**
VICE-PRESIDENT
-Yakima Petroleum Inc., Wapato, WA 98951
***Wholesale fuel distribution**
-Eagle Stop and Save, Inc.
***Fuel-convenience stores**
-Yakima Solutions Inc., Wapato, WA 98951
-Native Solutions Inc., Wapato, WA 98951
***Consulting and Business Management**

1985-1989 **CHAIRMAN, YAKAMA TRIBAL COUNCIL**

1971-1989 **YAKAMA TRIBAL COUNCIL (ELECTED)**
Committees served:
-Timber, Grazing, Overall Economic Development
-Loan, Extension, Education, and Housing
-Legislative
-Health, Employment, Welfare, Recreation, and Youth Activities
-Budget and Finance
-Executive Board
-Enrollment
-Special Tax Committee
-Radio Active/Hazardous Waste
-Public Relations/Media
-While serving on the Tribal Council for 18 years, I served as Chairman at one point of the listed committees

1971 **TRIBAL PLANNER**

1969-1970	**ASSISTANT MANAGER** **PERSONNEL MANAGER** **-White Swan Industries** **-Wholesale Furniture Manufacturing**
1968-1969	**RESIDENT COUNSELOR** **-Fort Simco Job Corps** **-Worked nights, commuted to CWSU during day**
1967-1968	**MANAGER TRAINEE** **-White Swan Industries** **-Wholesale Furniture Manufacturing**
1965-1967	**Industrial injury, not employed**
1961-1965	**STUDENT** **-Lower Columbia College, Longview, WA** **-While attending college, worked full time at night in a lumber planner mill in various jobs, including lumber grader.**
1959-1961	**-U.S. Army, Active Service**
1956-1959	**VARIOUS JOBS** **-Fisherman** **-Boeing Aircraft Company** **-Construction** **-Farm Labor**

EDUCATION:

American Indian Management Institute, Albuquerque, NM
-Completed six-week comprehensive studies on Tribal Executive Development
Central Washington State College, Ellensburg, WA
-Major: Sociology Minor: Psychology, Business
Lower Columbia College, Longview, WA
-Business Major
Lower Columbia College, Longview,WA
-Associate Degree in Electronics, 1963
White Swan High School, White Swan, WA.
-Graduate, 1956

ORGANIZATION AFFILIATES:

-Lifetime member, National Congress of American Indians

-Member, Fraternal Order of Eagles No. 2225, Toppenish, WA
-Founder, member, past Chairman, Northwest Portland Area Indian Health Board, Portland, OR. (18 years)
-Member, past Chairman, National Indian Health Board, Denver, CO (16 years)
-Served as a member, Indian Food & Nutrition Board, Denver, CO (3 years)
-Served, Yakima Valley College Board of Trustee, Yakima, WA (2 years)
-Served as member, founder, Heritage College Board of Trustees, Toppenish, WA
-Served on Advisory Board, Master of Public Health, University of California at Berkeley, CA. (2 years)
-Served on, Inter-Mountain School Board, Provo, UT (2 years)
-Member, President, Yakama Indian Rodeo Assoc., (25 years, volunteer)
-Member, founder, past President, Western States Indian Rodeo Assoc. (20 years)
-Member, founder, current President, Indian National Finals Rodeo, Inc.,(22 years)
-Served as member, Special Yakima Rodeo Board, to produce, promote the National High School Rodeo Finals in Yakima, WA. in 1980.
-Served on "The Advisory Panel on Alternative Means of Financing and Managing Radioactive Waste Facilities", Administrative Appointee, Depart. of Energy, 1984.

RECOGNITIONS:

-Yakama Indian Nation, Supervisor of the Year, 1995.
-Board Member of the year, Northwest Portland Area Indian Health Board, 4 times.
-Board Member of the year, National Indian Health Board, 2 times.
-Special Recognition of Appreciation as a Founder of Western States Indian Rodeo Association on their Tenth Anniversary.
-Special Recognition as a Founder of the Indian National Finals Rodeo from the American Revolution Bicentennial, 1776-1976.
-National Indian Rodeo Man of the Year, 1978, Hoof and Horns Magazine.
-National Indian Man of the Year, American Indian Heritage Foundation, Washington, D.C., 1988.

MILITARY EXPERIENCE:

1959-1965 VETERAN, United States Army, Honorable Discharge, SGT
1959-1966 E-5.

PERSONAL DATA:

Date of Birth: April 20, 1938
Tribe: Yakama, Enrollment # 4059
Marital Status: Married, 5 daughters, 1 son

HOBBIES AND INTERESTS:

-Hunting, Fishing, Horses, Sports, Crafts, & Rodeo

REFERENCES:

-Submitted upon request

RESUME

DAN C. BARRETT

TYPE OF POSITION
Upper Yakima Supplementation Complex Manager.

EXPERIENCE:

11/89 to 4/97 : Fish and Wildlife Manager "3" Bonneville Fish Hatchery

Management and Administrative

- Supervise 14 full-time employees, 6 seasonal, 10 egg-pickers
- Hire replacements through the interview process
- Review, sign and send in monthly time sheets
- Resolve employee conflicts through the State Management system
- Set up work plans and review on a regular basis
- Have weekly planning sessions
- Have monthly safety meetings
- Manage an annual budget of 1.4 million dollars
- Track expenditures and track budgets
- Prepare biennial and annual budgets and 5 year plans to include; PS. SS. capital items, capital improvements, and capital construction
- Prepare weekly and monthly reports to region and Portland office
- Give oral presentations to groups
- Train fish culturists from Mt. Hood Community College and 5 members from the Yakima Tribe in fish culture activities
- Public relations- Free Fishing Day, plan and organize the activity

Operations/Fish Production

- Plan the egg takes, spawning procedures and incubation of 32 million eggs
- Plan rearing of endangered species: Red Fish Lake Sockeye from Idaho; Spring Chinook from the Lostine River, Katherine Creek and Grand Rounde River
- Plan rearing and feeding of Tule Fall Chinook, UpRiver Brite Chinook, Coho, Chum and winter and summer steelhead
- Transportation of adult salmon and juveniles
- Calculate medications for disease prevention and treatments using microscopes, daily observation and activity of fish
- Schedule mandatory training of employees to include: First Aid, CPR, Defensive Driving and other courses as needed

RESUME – DAN C. BARRETT
PAGE 2

- Set up a maintenance schedule for all equipment, buildings and grounds
- Conduct weekly co-ordination meetings

3/82 to 11/89: Fish and Wildlife Manager"B" Roaring River Fish Hatchery

Management and Administrative

- Supervised one foreman, two technicians and two seasonals
- Prepared and administered a $500,000 biennial budget
- Prepared weekly and monthly reports on hatchery operations
- Evaluated hatchery employees and made annual work plans
- Attended the "CISPUS" Workshop on developing communication skills

Operation/Fish Production

- Planned and supervised egg takes from Rainbow Trout, a major brood stock station for the State of Oregons' legal trout program
- Incubation, rearing and release of legal trout
- Planned and reared Summer and Winter Steelhead to include incubation, grading and transportation
- Maintained the equipment, buildings and grounds
- Operated all equipment assoiciated with fish culture and a hatchery in general

3/80 to 3/82: Supervisor Fish and Wildlife Technician 3 Willamette Fish Hatchery

Management and Administrative

- Supervised one foreman and one hatcheryman in hatchery operations
- Prepared and administered budgets
- Prepared monthly, annual and special reports on hatchery operations
- Evaluated hatchery employees and made annual work plans

Operations / Fish Production

- Maintained a Rainbow Brood Stock
- Took eggs from Rainbow Trout, incubated them, reared them and released them as legal trout
- Assisted district biologist in stream and lake evaluations

8/75 to 3/80

Production Foreman at Bonneville Fish Hatchery. Supervised eight fish hatcherymen in the care and production of sixteen million Fall Chinook Salmon and Two million Coho Salmon. Assisted a Fish Hatchery Manager"C" in budgets and record keeping. I met with the public and gave talks to different organizations.

6/72 to 7/75

Foreman at Alsea Salmon Hatchery. I supervised two hatcherymen and assisted the manager in the operation of the hatchery. This included record keeping, budget preparation, propagation of salmon and maintenance of a salmon hatchery.

I started in the Fish Commission of Oregon in 1965 and have been located at eight different hatcheries in my career.

I was drafted into the Army in November of 1966 and came back into the Fish Commission in November of 1968.

EDUCATION:

Oregon State University, Corvallis, Oregon 1962-1965
Major: Fisheries Science -- did not graduate

Mt. Hood Community College, Gresham, Oregon 1979-1980
Major: Fisheries Technology -- Associate Degree.

SKILLS:

Operation and maintenance of trucks, welding, gas and arc. Repair of small engines and outboard motors. Woodworking, operation of calculators, typewriters (30wpm), computer skills (Microsoft word for windows, Lotus). I enjoy working with people and raising fish.

LICENSES:

Fork lift, multi-media first aid. Defensive drivers training, deputy game warden.

RESUEM – DAN C. BARRETT
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OUTSIDE ACTIVITIES:

Fishing, hunting gardening, golf and community project

PERSONAL DATA:

Birthdate -- August 18, 1944
Place of birth -- Herrington, Kansas
Height -- 6'1"
Weight - 225 lbs
Marital status -- Married 31 years
Children -- Boy 27 Girl 25

Address: Dan C. Barrett
HC 66 Box 1
Cascade Locks, Oregon 97014
Home Phone (541) 374-8043
Work Phone (541) 374-8393
FAX (541) 374-8090

Awards: AFS - Oregon Chapter- Bill Wingfield Memorial Award for "Fish Culture Excellence"
AFS - Western Division- Award of Merit
ODFW- Pride Award - Community Service, Work performance, Dedication
ODFW - Manager of the Year (Columbia Region)

REFERENCES

Mike Stratton
Regional Fish Hatchery Coordinator
Oregon Department of Fish & Wildlife
17330 SE Evelyn St.
Clackamas, Or 97015
(503) 657-2005 ex.226 - work
(503) 233-6749 - home

James W. Graybill
Fisheries Instructor, Mt Hood Community College
Science Division
2600 SE Stark St.
Gresham, Or. 97030
(503) 667-7163 - work
(503) 667-4547 - Home

Ray Sheldon
Regional Fish Hatchery Coordinator--Retired Manager, Retired
Oregon Department of Fish & Wildlife
13915 NE 29 Ave.
Vancouver , Wa 98686
360-574-0221

Vern Knowles
Bonneville Fish Hatchery
Oregon Department of Fish & Wildlife
1702 Avalon Place
Hood River, Or. 97031
541-386-5585

Further reference can be furnished on request

CURRICULUM VITAE

DAVID E. FAST

Fisheries Resource Management
P.O. Box 151
Toppenish, Washington 98948
Work: 509-966-5291

Education

University of Washington, Seattle, Washington
Doctor of Philosophy in Fisheries Science, 1987.

University of Puerto Rico, Mayaguez, Puerto Rico
Master of Science in Marine Sciences, 1974.
St. John's University, Collegeville, Minnesota
Bachelor of Science in Zoology, 1969.

Research Experience

1988-Present: Research Manager. Fisheries Resource Management Program, Yakima Indian Nation. Responsible for the design, development, and implementation of a major supplementation and research facility to test the concept of using artificial production to rebuild natural spawning populations of spring
chinook salmon in the Yakima Basin. Write detailed project plans, develop short and long-term project goals and objectives, and supervise professional and technical staff.

1985-1988: Project Leader. Spring Chinook Enhancement Study. Responsible for research project designed to determine the best methods of enhancing the spring chinook salmon population in the Yakima Basin. Evaluate survival through various life stages and total production of naturally producing salmon. Determine methods of supplementation with hatchery reared fish while minimizing adverse genetic impacts.

Fast, D.E. 1987. The Behavior of salmonid alevins in response to light, velocity and dissolved oxygen during incubation.

Pages 84-92 in Salmonid Migration and Distribution Symposium (E.L. Brannon, ed.), School of Fisheries, University of Washington, and Directorate for Nature Management, Norway, Trondheim, Norway.

Fast, D.E., J.D. Hubble, T.B. Scribner, M.V. Johnston, W.R. Sharp. 1989. Yakima/Klickitat Natural Production and Enhancement Program. 1989 Annual Report to Bonneville Power Administration. Project 88-120. 107 pp.

Fast, D.E. 1989. Supplementation Strategies For The Yakima/Klickitat Production Facility. Pages 143-147 in Northwest Fish Culture Conference Proceedings (R.Z. Smith, ed.).

Fast, D.E., J.D. Hubble, M.S.Kohn, and B.D.Watson. 1991. Yakima River Spring Chinook Enhancement Study. Project Completion Report to Bonneville Power Administration. Project 82-16. Volume 1 - 345 pp. and Volume 2 (Appendices) 133 pp.

Section 10. Information/technology transfer

The technical information resulting from this project (and its components tasks) will be distributed in the following ways:

- Where applicable, task specific, annual reports will be submitted to Bonneville consistent with the contract requirements and Bonneville will distribute copies to all individuals and agencies on its mailing list.

- Excerpted data will be appropriately formatted and submitted to the Northwest Aquatic Information Network (StreamNet) and made available to the public via the Internet.

- As an element of the YKFP, the objectives and findings of this project will also be entered into the YKFP home-page on the Internet. This home-page is currently under consturction, and should be operational sometime in 1998. The kind of information posted to the YKFP home-page will differ somewhat from tht posted to StreamNet. Specifically, the YKFP Internet site will contain more detailed and site-specific information than that in StreamNet, which has a regioanl perspcetive and therefore aggregates data in standardized units of larger geographic scope. There will also be more different kinds of data posted to the YKFp site than can presently be accomodated by StreamNet.

- The results of this study will also be presented and critiqued in a (public?) workshop hosted by the YKFP, the “Project Annual Review”. The Yakama

Indian Nation can be contacted for abstrats of presentations made at this workshop.

- Information pertinent to monitoring natural production and ecological interactions of species targeted by the YKFP will be incorporated into the appropriate specie's Monitoring Plans.